UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/594,852	09/29/2006	Hu Wei	P23151	3647

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EXAMINER
BOWEN, RICHARD L

ART UNIT	PAPER NUMBER
2156	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

	Application No.	Applicant(s)
Office Action Summary	10/594,852	WEI ET AL.
	Examiner	Art Unit	
	RICHARD BOWEN	2156	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>29 September 2006</u>.
2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-23</u> is/are pending in the application.
     4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5)☐ Claim(s) _____ is/are allowed.
6)☒ Claim(s) <u>1-23</u> is/are rejected.
7)☐ Claim(s) _____ is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.
10)☒ The drawing(s) filed on <u>29 September 2006</u> is/are: a)☐ accepted or b)☒ objected to by the Examiner.
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
     a)☐ All   b)☐ Some *   c)☐ None of:
         1.☐ Certified copies of the priority documents have been received.
         2.☐ Certified copies of the priority documents have been received in Application No. _____.
         3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
     * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
     Paper No(s)/Mail Date <u>9/29/06</u>.

4) ☐ Interview Summary (PTO-413)
     Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____ .

DETAILED ACTION

Information Disclosure Statement

1.   The information disclosure statement (IDS) submitted on September 29,

2006 was considered by the examiner.

Drawings

2.   Figure 6 should be designated by a legend such as --Prior Art-- because

only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings

in compliance with 37 CFR 1.121(d) are required in reply to the Office action to

avoid abandonment of the application. The replacement sheet(s) should be

labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as

not to obstruct any portion of the drawing figures. If the changes are not accepted

by the examiner, the applicant will be notified and informed of any required

corrective action in the next Office action. The objection to the drawings will not

be held in abeyance.

Specification

3.   The disclosure is objected to because of the following informality:

typographical error at page 18 line 6. The sequence code "100, 101, 001, 000"

should be replaced with "100, 010, 001, 000" to correct a typographical error.

This is apparent; because 101 is repeated twice, and the sentence references

that "each group contains forty (40) transactions."

Appropriate correction is required.

Claim Rejections - 35 USC § 101

4.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

5.   Claims 15-17 and 20-23 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

6.   Claims 15-17 and 20 rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Based on the recent Supreme Court decision, *Bilski v. Kappos*, a § 101 process should either (1) be tied to another statutory class (a particular machine or apparatus) or (2) transform underlying subject matter (such as an article or materials) to a different state or thing OR be something more than an abstract idea. 561 U.S. __ (2010) (slip op., at 7-8, 12 and 16). Here the claim fails to meet the above requirements because the steps are neither tied to another statutory class of invention (such as a particular apparatus) nor physically transform underlying subject matter (such as an article or materials) to a different state or thing. Applicant could overcome this rejection by specifying in the claim body that a programmed computer or other disclosed device is responsible for the inventive steps in the method (assuming applicant has sufficient original support for such a claim).

7.   Claims 21-23 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Claims involving transmission media, such as signals encoded with functional descriptive material do not fall within any of the categories of patentable subject matter set forth in 35

U.S.C. 101. MPEP 2106 IV.B. See, e.g., In re Nuitjen, Docket no. 2006-1371

(Fed. Cir. Sept. 20, 2007)(slip. op. at 18)("A transitory, propagating signal like

Nuitjen's is not a process, machine, manufacture, or composition of matter.' ...

Thus, such a signal cannot be patentable subject matter."). Applicant's

specification defines computer-readable medium to include both storage medium

and carrier waves as disclosed within the specification at page 21 lines 13-20.

However, the claims would be statutory under 35 U.S.C. 101 if "computer-

readable medium" is amended to "computer-readable storage medium."

Claim Rejections - 35 USC § 102

8.   The following is a quotation of the appropriate paragraphs of 35

U.S.C. 102 that form the basis for the rejections under this section made in this

Office action:

> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4, 10-12, 15-17 and 20-22 are rejected under 35 U.S.C. 102(b)

as being anticipated by Han et al. ("Mining Frequent Patterns without Candidate

Generation: A Frequent-Pattern Tree Approach," *Data Mining and Knowledge*

Discovery, Pages 53-87).

As per claim 1, Han discloses a system for mining data comprising:

a data store including data having a number of items (table I page 56);

a mining application to mine data in the data store, the mining

application including logic, the logic, when executed, is to: identify a

number of frequent items of the data store (scans the transaction database

once and collects the set of frequent items)(e.g. page 58);

compute a probe structure based on the number of identified

frequent items (e.g. algorithm 1 - sort frequent items in support-descending

order and generates figure 1)(page 58 and page 60) **and,**

partition the data according to content of the probe structure (the

data is partitioned as shown in figures 1-4)(page 58, 60, 62 and 65);

wherein the mining application uses the probe structure to build a

frequent pattern tree (FP-tree) (examples of fp trees are shown in Figs 1-4,

pages 58, 60, 62 and 65)(col 5 lines 38-51; Fig 5A-D); **and**

a memory for storing the probe structure and the FP-tree

(experiments are performed with 128 megabytes main memory)(page 76).

As per claim 2, Han discloses **the data of the data store includes a**

number of transactions, wherein each transaction comprises a unique

sequence of items identified by the logic when identifying the frequent

items of the data store (page 6; Table I).

As per claim 3, Han discloses **wherein the logic is to partition the**

transactions according to content of the identified frequent items to obtain

the probe structure (the logic identifies the frequent items and segments each

transaction into items and arranges the frequent items in descending order as

shown in table I and Example 1)(page 56-57), **wherein the probe structure**

includes combinations of the identified frequent items (Table I, page 56) **and**

the number of occurrences of one or more content-based transactions (if

two transactions share a common prefix, the shared parts can be merged using

one prefix structure as long as the count is registered properly)(page 57).

As per claim 4, Han discloses **the logic orders the identified frequent**

items based on an occurrence frequency of each identified item in the data

store (page 57).

As per claim 10, Han discloses system for mining data, the system

comprising:

a database including a number of transactions (table I page 56);

at least one processor to perform mining operations on the

database, the at least one processor is to execute content-based

partitioning logic on the transactions (the data is partitioned as shown in

Figures 1-4)(page 58, 60, 62 and 65),

wherein the content-based partitioning logic is to partition the

transactions according to content based on a number of identified frequent

items to obtain a probe structure (the logic identifies the frequent items and

segments each transaction into items and arranges the frequent items in

descending order as shown in table I and example 1)(page 56-57); **and**

a memory to store the probe structure (experiments are performed with

128 megabytes main memory)(page 76).

As per claim 11, Han discloses **the probe structure further comprising**

a probe tree and probe table (e.g. algorithm 1 - sort frequent items in support-

descending order and generates figure 1)(page 58 and page 60); **wherein the**

probe tree and probe table further comprise 2^M branches, wherein M

corresponds to the number of identified frequent items (e.g. pages 59-60).

As per claim 12, Han discloses **the memory further comprises shared**

memory to store the probe tree and probe table (page 69 section 4).

As per claim 16, Han discloses **scanning a first portion of the database**

when identifying frequent items of the database, and scanning a second

portion of the database when building the probe structure, wherein the

probe structure includes an associated number of counts with each branch

of the probe structure after scanning the second portion of the database

(page 57-58 and figure 1).

Claims 15 and 21 have similar limitations as stated in claims 1 and 10;

therefore they are rejected under the same subject matter.

Claims 17, 20 and 22 have similar limitations as stated in claim 3;

therefore they are rejected under the same subject matter.

Claim Rejections - 35 USC § 103

9.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for

all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described
> as set forth in section 102 of this title, if the differences between the subject matter sought to
> be patented and the prior art are such that the subject matter as a whole would have been
> obvious at the time the invention was made to a person having ordinary skill in the art to which
> said subject matter pertains. Patentability shall not be negatived by the manner in which the
> invention was made.

The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1,

148 USPQ 459 (1966), that are applied for establishing a background for

determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1.   Determining the scope and contents of the prior art.
2.   Ascertaining the differences between the prior art and the claims at
      issue.
3.   Resolving the level of ordinary skill in the pertinent art.
4.   Considering objective evidence present in the application indicating
      obviousness or nonobviousness.

10.   Claim 5-8,13,14, 18, 19 and 23 are rejected under 35 U.S.C. 103(a) as

being unpatentable over Han reference in view of Kamath et al. (U.S. Patent No.

7,007,035 B2).

As per claims 5, Han does not disclose, but Kamath teaches a **heuristic**

algorithm, wherein the heuristic algorithm is to group the one or more

content-based transactions into approximately equal groups (col 5 line 64 –

col 6 line 1; col 6 lines 25-26). One of ordinary skill in the art knows that heuristic

algorithms can be used to segment data into equal groups for allocating data to

other parallel processors to increase overall performance in data mining as

supported.   Therefore, one of ordinary skill in the art would know to incorporate

the parallel processors as disclosed by Kamath to partition the frequent item-

related projected databases of Han.

As per claim 6, Kamath discloses **a master processor and one or more**

slave processors, wherein the master processor is to distribute a group of

transactions to the one or more slave processors to build the FP-tree (col 5

line 64 – col 6 line 1).

As per claim 7, Kamath discloses **one or more slave processors build a part of the FP-tree based on the grouping of content-based transactions** (col 5 lines 60-65).

As per claim 8, Han discloses **to mine the FP-tree to determine unique information about the items of the data store** (page 65).

As per claim 13, Han discloses to **recursively mine the database** (e.g. pages 62 and 64), Kamath teaches that **wherein each processor shares a substantially equal load based on a grouping and distribution of the 2^M branches** (uniformly partition the data among multiple processors)(col 5 lines 60-65).

As per claim 14, Kamath inherently discloses that **the multiple processors further comprising a master processor and at least one slave processor to perform mining operations, wherein the master processor distributes operations to the at least one slave processor when building a frequent pattern tree (FP-tree) using the probe structure** (col 5 line 64 – col 6 line 1).

Claims 18-19 and 23 have similar limitations as stated in claims 6 and 7; therefore they are rejected under the same subject matter.

11.   Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Han in view of Campos et al. (U.S. Patent No. 7,174,343 B2).

Han does not disclose, but Campos teaches a **multi-core system architecture** (col 18 lines 5-10). One of ordinary skill in the art understands that

using a multi-core system architecture is advantageous, because as Campos

discloses it is impossible for any program to damage the execution of any of the

other programs running on the system (col 18 lines 25-27). Therefore in order to

preserve the data of other processors, one of ordinary skill in the art would

employ the teachings of Campos to the structure of Han.

Conclusion

Any inquiry concerning this communication or earlier communications from

the examiner should be directed to RICHARD BOWEN whose telephone number

is (571)270-5982. The examiner can normally be reached on Monday through

Friday 7:30AM - 4:00PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the

examiner's supervisor, Pierre M. Vital can be reached on (571)272-4215. The

fax phone number for the organization where this application or proceeding is

assigned is 571-273-8300.

Information regarding the status of an application may be obtained from

the Patent Application Information Retrieval (PAIR) system. Status information

for published applications may be obtained from either Private PAIR or Public

PAIR. Status information for unpublished applications is available through

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free). If you would like assistance from a USPTO Customer Service

Representative or access to the automated information system, call 800-786-

9199 (IN USA OR CANADA) or 571-272-1000.

/R. B./
Examiner, Art Unit 2156
7/19/2010

/D. L./
Primary Examiner, Art Unit 2168

/Pierre M. Vital/
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